

CLAIMS:

1. An insecticidal composition which:
 (i) is adapted for oral administration to an insect,
 (ii) comprises a proteinaceous pesticidal material
 obtainable from a *Xenorhabdus* species, or a pesticidal
 fragment thereof, or a pesticidal variant or derivative of
 either of these,
 having in each case toxic activity when administered orally.
2. A composition according to claim 1 wherein the said
 pesticidal material comprises material encoded by the
 nucleotide sequence of Figure 2 or variant or fragment
 thereof, or a sequence which hybridises with said
 sequence.
3. A composition according to claim 1 ~~or claim 2~~ which
 comprises cells of *Xenorhabdus*.
4. A composition as claimed in ^{claim 1} ~~any one of the~~
~~preceding claims~~ which comprises supernatant taken from
 cultures of cells of *Xenorhabdus* species.
5. A composition according to any one of the preceding
 claims wherein the *Xenorhabdus* species is *Xenorhabdus*
nematophilus.
6. A composition according to ^{claim 1} ~~any one of claims 1 to 4~~
 wherein the *Xenorhabdus* species is ATCC 19061, NCIMB
 40886 or NCIMB 40887.
7. A composition as claimed in ^{claim 1} ~~any one of the preceding~~
~~claims~~ which comprises a further pesticidal material not
 obtainable from *Xenorhabdus*.
8. A composition according to claim 7 wherein the said
 further pesticidal material comprises a material
 obtainable from *B. thuringiensis*.

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9. A composition according to claim 8 which further comprises cells of *B. thuringiensis*.

10. A composition according to claim 8 wherein the pesticial materials obtainable from *B. thuringiensis* comprises the delta endotoxin.

a 11. A composition according to ^{claim 1} ~~any one of the preceding claims~~ which further comprises an agriculturally acceptable carrier.

12. A composition according to claim ¹¹ ~~10~~ wherein the carrier comprises items of insect diet.

13. A method for killing or controlling insect pests, which method comprises administering to a pest or the environment thereof a composition according to any one of the preceding claims.

a 14. A method as claimed in claim ¹³ ~~12~~ wherein the pests are insects from the order Lepidoptera or Diptera.

15. A microorganism comprising *Xenorhabdus* strain NCIMB 40886.

16. A microorganism comprising *Xenorhabdus* strain NCIMB 40887.

17. A pesticidal agent which comprises a a toxin comprising a protein which is encoded by DNA which includes SEQ ID No. 1 or a variant or fragment thereof.

18. An isolated pesticidal agent characterised in that it is obtainable from cultures of *X. nematophilus* or mutants thereof, has oral pesticidal activity against *Pieris brassicae*, *Pieris rapae* and *Plutella xylostella*, is substantially heat stable to 55°C, is proteinaceous, acts synergistically with *B. thuringiensis* cells as an

oral pesticide, and is substantially resistant to proteolysis by trypsin and proteinase K.

19. An isolated pesticidal agent as claimed in claim 18
5 further characterised in that the pesticidal activity is substantially destroyed by treatment with sodium dodecyl sulphate or acetone or heating to 80°C.

20. An isolated pesticidal agent as claimed in claim 18
10 ~~or claim 19~~ further characterised in that the agent is an extracellular protein.

21. A recombinant DNA which encodes a pesticidal agent
according to ^{claim 17} ~~any one of claims 17 to 20~~.

22. A recombinant DNA of claim 21 which comprises the
sequence of Figure 2 or a variant or fragment thereof.

23. A recombinant DNA which comprises or hybridises
20 under stringent conditions with all or part of the sequence of Figure 2, and which encodes a pesticidal material.

24. An expression vector comprising a recombinant DNA
25 according to ^{claim 21} ~~any one of claims 21 to 23~~.

25. A host organism which has been transformed with an
expression vector according to claim 24.

26. A host organism as claimed in claim 25 which has been
30 engineered or selected such that it also expresses other pesticidal proteinaceous toxicity enhancing materials

27. A host organism comprising a nucleotide sequence
35 coding for a fusion protein comprising a pesticidally active portion of an agent as claimed in, ^{claim 17} ~~any one of claims 17 to 20~~ in combination with other pesticidal proteinaceous toxicity enhancing materials.

28. A host organism as claimed in claim 27 wherein the pesticidal toxicity enhancing materials comprise delta-endotoxin from *B. thuringiensis*.

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29. A host organism as claimed in ^{Claim 25} ~~any one of claims 25 to 28~~ wherein the host is a plant.

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30. A host organism as claimed in ^{Claim 25} ~~any one of claims 25 to 28~~ wherein the host is a virus pathogenic to insects.

31. A fusion protein as expressed by a host as claimed in claim 27.

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32. A pesticidal composition comprising one or more agents as claimed in ^{Claim 17} ~~any one of claims 17 to 20~~.

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ADD B17

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